

We claim:

1. A door edge protection system mountable in conventional autorack railcars for transporting automobiles having side doors, each said railcar having side walls with holes therethrough, said system including:

a resilient foamed cushioning material covering a portion of at least one of said railcar side walls at the level of the doors of the automobiles being transported, so that when the door of the automobile is opened the material will be positioned between the door and the railcar side wall covered by said material for cushioning and protecting the automobile door edge against impact with the railcar side wall; and

penetrating fasteners formed and arranged for securely fastening said cushioning means to the inner surface of the side walls, each of said fasteners having a leg extending through said cushioning material and adapted to fit into at least one of the holes in the railcar side wall, and having a locking formation on said fastener leg for engaging the exterior of the side wall and locking said fastener in place after said fastener leg has passed through the hole in the side wall; said resilient foamed cushioning material being formed from a flat piece of foam material having at least a first edge portion and having a second portion;

said edge portion being rolled over and bonded to the second portion to form at least one tube;

said tube being formed and arranged whereby a mounting portion is also formed whereby the mounting portion is adapted to receive said fasteners and be captured between said fastener and the side wall.

- 5 2. A door edge protection system for convention autorack railcars for transporting automobiles, each said railcar having side walls with a plurality of holes therethrough, said system including:

10 a first portion of foam material rolled over to form a tube extending substantially the length of the material;

 a second portion of foam material extending substantially tangentially from said first portion so as to define a flange portion; and

15 a plurality of penetrating fasteners, each having an enlarged head and a leg with a resilient locking formation thereon, whereby the leg of each fastener will extend through said second portion of foam material and through a corresponding one of the holes in the railcar side wall with the locking formation engaging the exterior of the side wall adjacent the hole to lock the fastener in place and securely hold the second portion of foamed
20 material against the interior of the railcar side wall.

3. A door edge protection system in accordance with claim 2 and further including a third portion of foam material rolled over onto itself to form a tube, said third portion being attached to said second portion in spaced parallel relation to said first portion, whereby

said protection system will extend substantially parallel to the wall of the car a selected length.

4. A door edge protection system in accordance with claim 2 wherein said mounting portions of foam material includes a plurality of apertures extending therethrough to facilitate the passage of the fastener legs therethrough in the attachment of the system to the interior side wall of the railcar.

5. A door edge protection system in accordance with claim 2 wherein said second portion of foam material includes a plurality of apertures extending therethrough to facilitate the passage of the fastener legs therethrough in the attachment of the system to the interior side wall of the railcar.

6. A door edge protection system in accordance with claim 2 wherein said fastener locking formation has one or more pairs of transversely extending resilient locking edges to resiliently engage the exterior of the side wall of the railcar to fixedly secure one or more layers of said foam material to the interior side wall of the railcar.

7. The structure of claim 2 wherein the railcar has supporting struts along the side walls, and said first portion of foam material extends between struts, said protection system further including a fourth portion of foam material extending between the ends of said adjacent first portions of foam material and extending over and providing cushioning over the struts of the railcar between said first portions of foam material.

8. A door edge protection system in accordance with claim 1 wherein said second portion of foam material is a separate sheet bonded to said first portion and said second portion includes a plurality of apertures extending therethrough to facilitate the passage of the fastener legs therethrough in the attachment of the system to the interior side wall of the railcar.

9. A door edge protection system in accordance with claim 8 wherein said first portion is formed as a tube defining a space therein, and said space is filled with a third foam member.

10. A door edge protection system in accordance with claim 8 wherein said first portion is formed having a relatively high density foam and said third foam member is a relatively low density foam.

11. A door edge protection system in accordance with claim 8 wherein said first portion is formed of a foam having a density of about 4 lbs and said third foam member having a density of about 1.2 to 1.7 pounds.

12. A door edge protection system in accordance with claim 8 wherein said second portion contacts and is bonded to said first portion over greater than 90 degrees.

13. A door edge protection system in accordance with claim 8 wherein said second portion contacts and is bonded to said first portion over about 135 degrees.

14. A method of providing a door edge protection system in conventional autorack railcars including the steps of:

affixing one or more flat pieces of foam material over the posts along the inner wall of the conventional autorack railcar; and

affixing a plurality of second pieces of foam material along the inner wall of the conventional autorack railcar, said second pieces rolled into one or more tubes and placed linearly along the inner wall of the conventional autorack railcar at about the same height as the door edge of an automobile, said second pieces positioned so as to overlap said first piece of foam material.

15. A method of providing a door edge protection system in accordance with claim 14 further including the step of fastening said first and second pieces with a plurality of button-shaped fasteners.

16. A method of providing a door edge protection system in accordance with claim 15 further including the step of providing said fasteners with a plurality of locking edges to assist in the fastening of one or more pieces of foam material.

17. A method of providing a door edge protection system in accordance with claim 14 and said method including mounting a foam encased pipe between the posts where the wall of the autorack car does not have button receivable apertures.

18. A method of providing a door edge protection system in accordance with claim 14 and said tubes define a space therein, and said space is filled with a third foam member.

19. A door edge protection system in accordance with claim 8 wherein said first portion is formed having a relatively high density foam and said third foam member is a relatively low density foam.

20. A method of providing a door edge protection system in accordance with claim 14 and said method including mounting a foam encased pipe between the posts where the wall of the autorack car does not have button receivable apertures;

said tubes define a space therein, and said space is filled with a third foam member;

said first portion is formed having a relatively high density foam and said third foam member is a relatively low density foam;

said second pieces of foam material are bonded to a separate sheet defining a mounting portion; said mounting portion includes a plurality of apertures extending therethrough to facilitate the passage of the fastener legs therethrough in the attachment of the system to the interior side wall of the railcar.

and said mounting portion contacts and is bonded to said tube over greater than 90 degrees.

21. A door edge protection system mountable in conventional autorack railcars for transporting automobiles having side doors, each said railcar having side walls with holes therethrough, said system including:

5 a resilient foamed cushioning material covering a portion of at least one of said railcar side walls at the level of the doors of the automobiles being transported, so that when the door of the automobile is opened the material will be positioned between the door and the railcar side wall covered by said material for cushioning and protecting the automobile door edge against impact with the railcar side wall; and

10 penetrating fasteners formed and arranged for securely fastening said cushioning means to the inner surface of the side walls, each of said fasteners having a leg extending through said cushioning material and adapted to fit into at least one of the holes in the railcar side wall, and having a locking formation on said fastener leg for engaging the exterior of the side wall and locking said fastener in place after said fastener leg has
15 passed through the hole in the side wall; said resilient foamed cushioning material being formed from a first, substantially flat piece of foam material, and a second, substantially cylindrical piece of foam material;

20 said substantially flat piece being at least partially rolled over and bonded to the second substantially cylindrical piece to form a cushioning element;

said cushioning element being constructed and arranged such that a mounting portion is also formed in said substantially flat piece, distal from said substantially cylindrical piece,

the mounting portion adapted to receive said fasteners and be captured between said fastener and the side wall.

22. A door edge protection system for conventional autorack railcars for transporting automobiles, each said railcar having side walls with a plurality of holes therethrough, said system including:

resilient cushioning material formed from a first, substantially flat piece of foam material, and a second, substantially cylindrical piece of foam material;

said substantially flat piece being at least partially rolled over and bonded to the second substantially cylindrical piece to form a cushioning element;

said cushioning element being constructed and arranged such that a mounting portion is also formed in said substantially flat piece, distal from said substantially cylindrical piece, the mounting portion adapted to receive fasteners and be captured between said fastener and the side wall;

a plurality of penetrating fasteners, each having an enlarged head and a leg with a resilient locking formation thereon, whereby the leg of each fastener extends through said mounting portion and through a corresponding one of the holes in the railcar side wall with the locking formation engaging the exterior of the side wall adjacent the hole to lock the fastener in place and securely hold the cushioning element against the interior of the railcar side wall.